

WHAT IS CLAIMED IS:

1. A nucleic acid present in other than its natural environment, wherein said nucleic acid encodes a chromo- or fluorescent protein and is from a non-bioluminescent Cnidarian species.

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2. The nucleic acid according to Claim 1, wherein said non-bioluminescent Cnidarian species is an Anthozoan species.

10 3. The nucleic acid according to Claim 1, wherein said nucleic acid is isolated.

4. A nucleic acid present in other than its natural environment, wherein said nucleic acid encodes an Anthozoan chromo- or fluorescent protein and is from a non-Pennatulacean Anthozoan species.

15 5. The nucleic acid according to Claim 4, wherein said nucleic acid is isolated.

6. A nucleic acid having a sequence of residues that is substantially the same as or identical to a nucleotide sequence of at least 10 residues in length of SEQ ID NOS:01, 03, 05, 07, 09, 11, 13, 15, 17.

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7. The nucleic acid according to Claim 6, wherein said nucleic acid has a sequence similarity of at least about 60% with a sequence of at least 10 residues in length selected from the group of sequences consisting of SEQ ID NOS: 01, 03, 05, 07, 09, 11, 13, 15, 17.

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8. A nucleic acid present in other than its natural environment that encodes a chromo and/or fluorescent protein, wherein said protein is either:

30 (a) from a non-bioluminescent Cnidarian species; or

(b) from a non- Pennatulacean Anthozoan species.

9. The nucleic acid according to Claim 8, wherein said non-bioluminescent Cnidarian species is an Anthozoan species.

35 10. The nucleic acid according to Claim 9, wherein said nucleic acid is isolated.

11. The nucleic acid according to Claim 9, wherein said protein has an amino acid sequence selected from the group consisting of: SEQ ID NOS: 02; 04; 06; 08; 10; 12; 14; 16; and 18.

12. A nucleic acid that encodes a mutant protein of a chromo and/or fluorescent protein that is either:

5 (a) from a non-bioluminescent Cnidarian species; or  
(b) from a non- Pennatulacean Anthozoan species.

13. The nucleic acid according to Claim 12, wherein said non-bioluminescent Cnidarian species is an Anthozoan species.

10 14. The nucleic acid according to Claim 12, wherein said mutant protein comprises at least one point mutation as compared to its wild type protein.

15. The nucleic acid according to Claim 12, wherein said mutant protein comprises at least one deletion mutation as compared to its wild type protein.

16. A fragment of the nucleic acid selected from the group consisting of:

20 (a) a nucleic acid encoding a chromo- or fluorescent protein from a non-bioluminescent Cnidarian species;  
(b) a nucleic acid encoding an Anthozoan chromo- or fluorescent protein from a non-Pennatulacean Anthozoan species;  
(c) a nucleic acid having a sequence of residues that is substantially the same as or identical to a nucleotide sequence of at least 10 residues in length of SEQ ID NOS:01, 03, 05, 07, 09, 11, 13, 15, 17; and  
(d) a nucleic acid that encodes a mutant protein of an Anthozoan chromo and/or fluorescent protein that is either:

25 (i) from a non-bioluminescent Cnidarian species; or  
(ii) from a non- Pennatulacean Anthozoan species.

17. The fragment according to Claim 16, wherein said non-bioluminescent Cnidarian species is an Anthozoan species.

18. An isolated nucleic acid or mimetic thereof that hybridizes under stringent conditions to a nucleic acid selected from the group consisting of:

30 (a) a nucleic acid encoding a chromo- or fluorescent protein from a non-bioluminescent Cnidarian species;  
(b) a nucleic acid encoding an Anthozoan chromo- or fluorescent protein from a non-Pennatulacean Anthozoan species;

10 (c) a nucleic acid having a sequence of residues that is substantially the same as or identical to a nucleotide sequence of at least 10 residues in length of SEQ ID NOS:01, 03, 05, 07, 09, 11, 13, 15, 17;

5 (d) a nucleic acid that encodes a mutant protein of an Anthozoan chromo and/or fluorescent protein that is either:

- (i) from a non-bioluminescent Cnidarian species; or
- (ii) from a non- Pennatulacean Anthozoan species; and
- (e) fragments of the above sequences;

15 or its complementary sequence.

20 19. The nucleic acid according to Claim 18, wherein said non-bioluminescent Cnidarian species is an Anthozoan species.

25 20. A construct comprising a vector and a nucleic acid selected from the group consisting of:

- (a) a nucleic acid encoding a chromo- or fluorescent protein from a non-bioluminescent Cnidarian species;
- (b) a nucleic acid encoding an Anthozoan chromo- or fluorescent protein from a non-Pennatulacean Anthozoan species;
- (c) a nucleic acid having a sequence of residues that is substantially the same as or identical to a nucleotide sequence of at least 10 residues in length of SEQ ID NOS:01, 03, 05, 07, 09, 11, 13, 15, 17;
- (d) a nucleic acid that encodes a mutant protein of a chromo and/or fluorescent protein that is either:

  - (i) from a non-bioluminescent Cnidarian species; or
  - (ii) from a non- Pennatulacean Anthozoan species;
  - (e) a fragment of the above nucleic acids; and
  - (f) a nucleic acid or the complement thereof that hybridizes under stringent conditions to the above nucleic acids.

30 21. The construct according to Claim 20, wherein said non-bioluminescent Cnidarian species is an Anthozoan species.

35 22. An expression cassette comprising:

- (a) a transcriptional initiation region functional in an expression host;
- (b) a nucleic acid selected from the group consisting of the nucleic acids of Claims 1 to 21; and
- (c) and a transcriptional termination region functional in said expression host.

15 23. A cell, or the progeny thereof, comprising an expression cassette according to  
Claim 22 as part of an extrachromosomal element or integrated into the genome of a host  
cell as a result of introduction of said expression cassette into said host cell.

20 5 24. A method of producing a chromo and/or fluorescent protein, said method  
comprising:  
growing a cell according to Claim 23, whereby said protein is expressed; and  
isolating said protein substantially free of other proteins.

25 10 25. A protein or fragment thereof encoded by a nucleic acid selected from the group  
consisting of Claims 1 to 21.

30 26. An antibody binding specifically to a protein according to Claim 25.

35 27. A transgenic cell or the progeny thereof comprising a transgene selected from the  
group consisting of a nucleic acids according to any of Claims 1 to 21.

40 28. In an application that employs a chromo- or fluorescent protein, the improvement  
comprising:  
employing a protein according to Claim 25.

45 29. In an application that employs a nucleic acid encoding a chromo- or fluorescent  
protein, the improvement comprising:  
employing a nucleic acid according to Claims 1 to 21.

50 30. A kit comprising a nucleic acid according to Claims 1 to 21 and instructions for  
using said nucleic acid.